

### Abstract

Novel synthases and the corresponding nucleic acids encoding such synthases are disclosed herein. Such synthases possess an active site pocket that includes key amino acid residues that are modified to generate desired terpenoid reaction intermediates and products. Synthase modifications are designed based on, e.g., the three-dimensional coordinates of tobacco 5-*epi*-aristolochene synthase, with or without a substrate bound in the active site.

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